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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/613,908	07/03/2003	Shyh-Chin Huang	134495-1	7212
6147	7590	03/03/2006	EXAMINER	
GENERAL ELECTRIC COMPANY GLOBAL RESEARCH PATENT DOCKET RM. BLDG. K1-4A59 NISKAYUNA, NY 12309			WYSZOMIERSKI, GEORGE P	
			ART UNIT	PAPER NUMBER
			1742	

DATE MAILED: 03/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/613,908	Applicant(s) HUANG ET AL.	
	Examiner George P. Wyszomierski	Art Unit 1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 December 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) 11, 16, 29 and 38 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10, 12-15, 21-28 and 31-37 is/are rejected.
- 7) ☒ Claim(s) 17-20, 30, 39 and 40 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

1. Applicant's traversal of the restriction requirement made in the prior Office Action is acknowledged. The traversal is on the grounds that the non-elected claims are directed to components produced by the method of the elected claims, and therefore "components produced by any other method would not be encompassed by the [non-elected] claims." The examiner respectfully disagrees. A product-by-process claim defines a product. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process; see *In re Thorpe* (227 USPQ 964, Fed.Cir. 1985). The requirement is deemed proper and is therefore made FINAL.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 2, 3, 6, 8, 9, 21, 22, 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over WIPO 00/37241.

The WIPO document discloses forming a composite material including a nanosize reinforcement as set forth in claims 3 or 22 in a molten matrix, by cooling a rotating cavity containing the molten matrix material and powders of the reinforcement. With respect to instant claim 2, the method disclosed in WIPO '241 does not appear to result in any substantive change in the size, quantity, or chemistry of the reinforcement material. With respect to instant claims 6, 8, 21 and 26, the sides of the rotating cavity in the '241 reference are stated to be a mold, and

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the final material produced therein appears to be a near net shape product. With respect to instant claims 9 and 27, the WIPO disclosure is directed to the production of automobile parts, which may clearly require some physical alteration to properly fit a particular vehicle. With respect to instant claim 21, while the drawing figure of the prior art depicts a container rotating on a horizontal axis, this container is mounted on a movable mechanism **26** that can tilt, which would result in rotation about a vertical axis in accord with the instant claims.

The prior art does not use the term "convection vortex". The examiner's position is that the rotation of the container used in the '241 process will cause a physical mixing and moving of the molten material and the reinforcement in such a manner that convection occurs and a vortex created. Thus, the process as recited in the instant claims is held to be not patentably distinguishable from that as disclosed by WIPO '241.

4. Claims 1-10, 12-15, 21-28 and 31-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Angeliu et al. (U.S. Patent 6,251,159).

Angeliu discloses forming a composite material including nanophase particles in a metal matrix, by mixing and dispersing the nanophase particles in a metallic melt by convection mixing; see Angeliu column 4, lines 47-50. With respect to instant claim 2, the method disclosed by Angeliu does not appear to result in any substantive change in the size, quantity, or chemistry of the nanophase particles. The particles and the matrix material may be the same as those of instant claims 3, 4, 22, 23, 32 and 33; see Angeliu column 3, lines 19-39. With regard to instant claims 5, 24 and 34, the examiner's position is that use of the same materials and process steps would result in an equivalent grain structure in either the prior art or the claimed process. With respect to instant claims 6-10 and 21-28, Angeliu column 5, lines 19-30 indicates that the particles will remain suspended in the metallic melt until solidification, and the

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melt can then be processed by physical working steps into a large article such as a rotor for a steam turbine. With respect to instant claims 12-15, 31, and 35-37, this act of processing the molten material including the nanophase particles into a large casting, as disclosed by Angeliu column 5, line 22, at least suggests the limitations regarding solidifying in flight as recited in these claims.

Angeliu does not specify rotating the container in order to cause the convection vortex, as required by the instant claims. This difference is not seen as resulting in a patentable distinction between the prior art and the claimed invention because Angeliu column 4, lines 47-55 indicates that the manner of mixing the particles into the matrix is not critical, and may include using a stirrer, electromagnetic mixing, and the use of physical mixing devices. This at least suggests a step of rotating the container, as done in the presently claimed process.

Consequently, a prima facie case of obviousness is established between the disclosure of Angeliu et al. and the presently claimed invention.

5. Claims 1-10, 12-15, 21-28 and 31-37 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-30 of U.S. Patent No. 6,939,388 in view of Angeliu et al. The '388 claims define a process of making a nanocomposite material including a dispersion of nano-sized material within a solid matrix by solidifying a molten material having the nano-sized material added thereto. The '388 claims do not recite the convection vortex as required by the instant claims, i.e. the '388 claims agitate the molten material using ultrasonic energy in order to disperse the nano-sized material within the molten material. Angeliu '159 column 4, lines 47-55 indicates convection mixing to be a known equivalent to electromagnetic

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stirring, in the art of forming composites including nanoparticles in a melt. Thus, it would have been an obvious expedient to employ the convection vortex as presently claimed as a mixing step in the process as claimed in the '388 patent.

6. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

7. The prior Office Action included a rejection of certain claims based on a Kawabe et al. Abstract. The rejection based on Kawabe is withdrawn at this time, as the other prior art discussed supra is clearly more relevant to the claimed invention.

In a response filed December 29, 2005, Applicant alleges that the claimed invention can be distinguished from the prior art in that the presently claimed "convection vortex" would be an undesirable feature in the process of WO '241, that the general teaching of mixing methods in Angeliu '159 would not include the convection vortex as presently claimed, and/or that neither Angeliu '159 or '388 necessarily involve

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a vortex or rotating the container to produce one. Applicant's arguments have been carefully considered, but are not persuasive of patentability because the term "convection vortex" (required by all of the pending claims) is not defined in the specification, nor has any definition of this term been suggested by Applicant. In the absence of any particular definition of this term, the dispersing and mixing steps recited in the prior art are held to be equivalent to a step of creating a convection vortex, at least to the extent as required by the instant claims.

8. Claims 17-20, 30, 39 and 40 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art does not disclose or suggest pressurizing the container as required by the instant claims.

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to George Wyszomierski whose telephone number is (571) 272-1252. The examiner can normally be reached on Monday thru Friday from 8:00 a.m. to 4:30 p.m. Eastern time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King, can be reached on (571) 272-1244. All patent application related correspondence transmitted by facsimile must be directed to the new central facsimile number, (571)-273-8300. This new Central FAX Number is the result of relocating the Central FAX server to the Office's Alexandria, Virginia campus.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


GEORGE WYSZOMIERSKI
PRIMARY EXAMINER
GROUP 1742

GPW
February 21, 2006